Quad Graphics Loveland

“The Drive for 99.5”

Recovery of Recyclables from the Trash and Maintaining Effective Recycling Programs:

QuadGraphics

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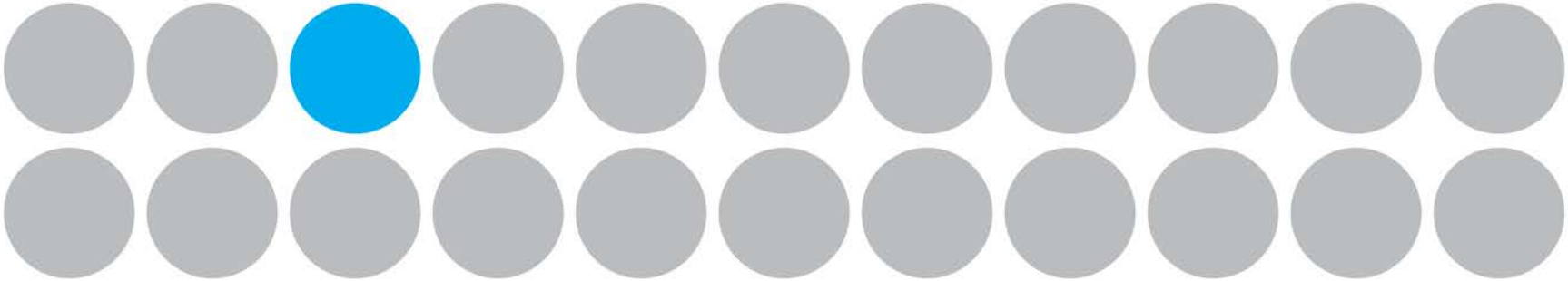

The Problem – Quad trash is composed of 40%-95% Recyclables

- In all plants daily, volumes of easily recycled paper, plastics, metals and other recyclables are being disposed of in the trash

- General composition of recyclables in the trash
  - 75% paper
  - 10% plastics
  - 10% Item for Waste To Energy (heavily contaminated with ink/oil and other non-landfill able items)
  - 5% comingles (cans/bottles) and other

- The “Double Whammy”
  - Trash = Landfill cost and robs $$ from the plants bottom line
  - Recyclables in the trash = Lost income opportunity to contribute to the bottom line

How do you Find the Problem?
Look in the Trash / Find the Source

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What does the problem cost Quad?

- Expense = $50 to $250/ton to landfill solid waste (depending on geographic location and disposal options)
- Failure to capture income =
  - The Biggest Loser : Paper = $75 to $200/ton
  - Plastics = $0 to $460/ton
  - Metals = $100 to $2000/ton
  - Cans/Bottles and other
- Inability for the company to achieve a more sustainable business model
- Compliance and exposure to extended liability (associated with land filling heavily inked/oily paper and aerosol cans) from a masked issue

What is the Goal?

- Drive up the plant's recycling rate to at least 99.5%
  - > QG Corporate average in 2011 was 98.08%
  - > Average in 2012 (active operations only) was;
    - QG = 98.3%
    - Vertis = 94.3%
    - Combined Companies = 97.9%

- 99.5% rate requires a 9,270 ton annual reduction in trash volume by capturing recyclables that currently end up in trash and commitment to a WTE program (using 2012 statistics based on trash generation of 12,202 tons)

What is the Solution?

Phase 1:

- Implement or tweak standardized machine and department level collection of recyclables
  - > Point of Use (POU) containers, smaller containers
  - > Centralized accumulation points, larger containers to dump POU containers
  - > All collection points/containers labeled and color coded
- Elimination of most trash containers
- Education and awareness training (ongoing)
- Support from plant teams and all leadership
- Provision of Scorecard to track progress and gauge effectiveness

The Solution – Color Standard POU

- Color standardization is used for collection of small volumes of recyclables, at the point of generation, that commonly are thrown in the trash;
- Green – Co-mingle (cans, bottles, glass, tin)
- Blue – Films (stretch, poly, shrink wrap)
- Yellow – PP strap (White, clear, blue, yellow)
- Red – Paper
- Gray – Trash
- Black – Misc Scrap Metal

The Solution – Point of Use Collection

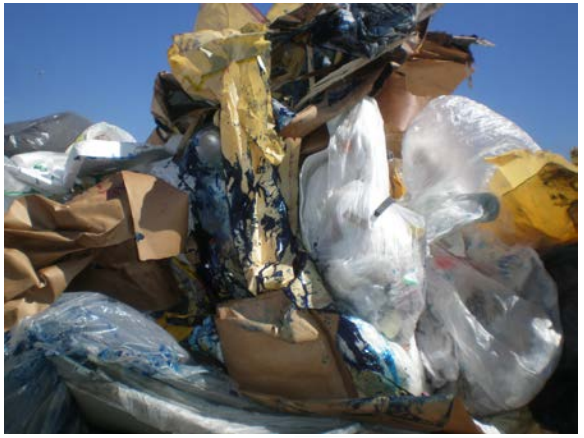
- Examples of Point of Use Programs

The Solution – Centralized Collection

- Examples

What is the Masked Issue? Items we can't recycle but don't want to put into the landfill. WTE Program.

- Paper heavily contaminated with ink (free flowing) and saturated with oil
- Used blanket wash fabric and similar
- Aerosol cans containing such liquids as brake cleaner and other solvents



The Solution

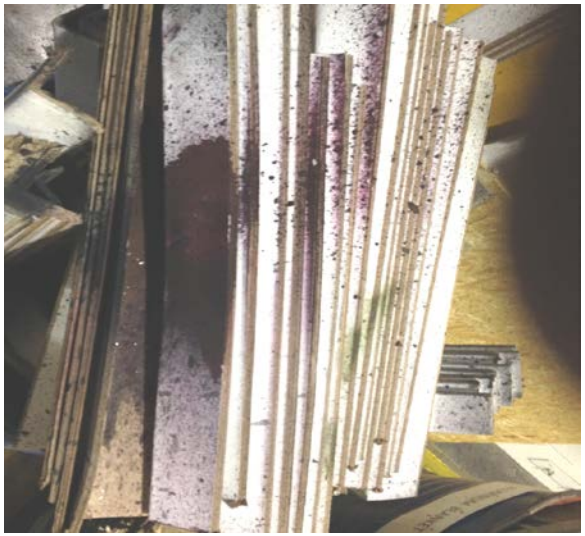
Phase 2

- Implement a "Waste to Energy" (WTE) program for contaminated solids
- Implement an aerosol can collection program
- Used battery collection program
- Used florescent light collection program

➢ A commitment to manage in the most responsible manner

Items for WTE



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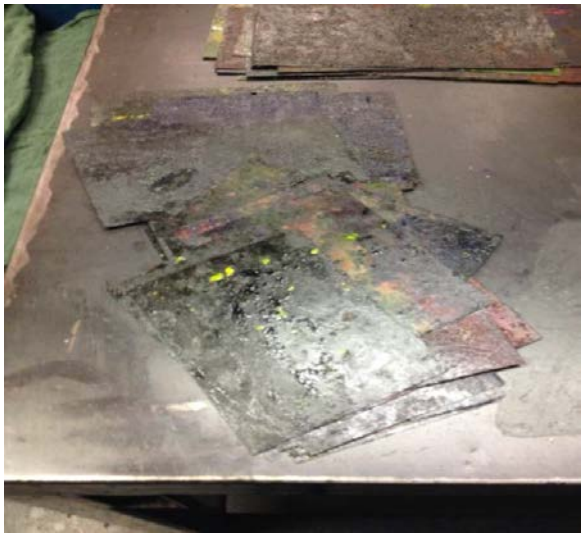

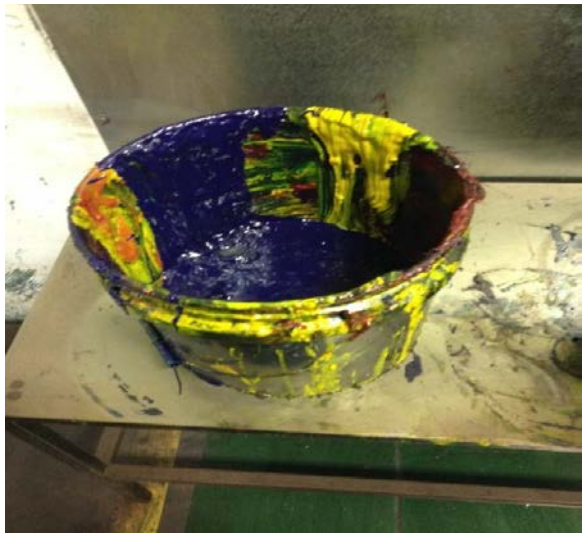

Other Measurements

- Perform an annual “Dumpster Dive” with your plant team, at your local landfill
  - Impactful, eye opening, life changing
  - Most effective means to change behaviors and inspire champions



  - See a “dive” first hand: http://teamsites.qg.com/Distribution/Recycling/Recycling%20Department%20Information/VIDEO0004.3gp

The Economics – a "holistic approach"

- 2012 data as the base comparative year, the benefits of a world class Recycling management program yielding a 99.5% recycling rate are;

$ 786,287	Cost avoidance from land filling (9,268 tons * $ 75-100/ton ave)
$ 695,163	Income from paper recovered (6,951 tons * $ 100/ton ave)
$ 46,344	Income from plastics recovered (926 tons * $ 50/ton ave)
($ 23,172)	Cost of Comingle program (434 tons * $ 50/ton ave cost)
($ 463,442)	Cost of WTE program (926 tons * $ 500/ton ave cost)

At this time Loveland will send WTE boxes along with Dust Pucks / Prepress White Stock to SLC Approx $1,000 per truckload of 44,000 pounds. Landfill 44,000 would cost approx $900.

$ 1,041,180 Annual Bottom Line Benefit for QG

Economics- continued

- "Trash Efficiency" – Best Practices for what is left to landfill
  - > Maximize weight per compactor hauled
    - Monitor fullness of compactor for scheduling pick ups
    - Service should be "on-call" and not scheduled
      - > **Currently being done in Loveland**

Deliverables from Successful Program Implementation and Sustain

- Reduce trash generation by 76% (9,268 ton reduction annually) to a target of 2,934 tons = Decrease landfill cost

- Expand the Waste to Energy program to all plants
  - Eliminate risks associated with placing non-conforming material into landfill

- Create a world class recycling management program that everyone can be proud of

- Enable the company and locations to tout a large sustainability/environmental chip that will create positive PR on top of the economic windfall listed above

Measurements of Performance

- Scorecard – quarterly
  - > Same format as Plant Scorecards with corporate roll up
  - > provided offline by Corporate Recycling
  - > Likely to expand to include other Recycling performance elements

Plant Scorecard	Loveland							
Group-Directory					Trailing 3 Quarters			YTD
Metric	FY 2011	FY2012	2013 Plan	Stretch	Q3 2012	Q4 2012	Q1 2013	2013
Solid Waste Management:								
Trash Volume (tons)	171.1	117.8	46.3	23.2	15.4	42.0	40.0	40.0
Trash Rate (as %)	1.6%	1.3%	0.50%	0.25%	0.6%	2.0%	1.6%	1.6%
Recycling Volume (tons)*	10,435	9,150			2,396	2,043	2,428	2,428
Recycling Rate (as %)*	98.4%	98.7%	99.50%	99.75%	99.4%	98.0%	98.4%	98.4%

* Only represents scrap paper volumes recycled.

**2013 plan trash volume is solely based on 2012 trash generation.

	Recycle Verified Weights	In Process of Verification Weights	Recycle Savings As of June 1st
Recycled LBS from Shipping	11,303,651		3,810,631
Recycled LBS from Receiving	1,121,805	1,385,790	439,928
Recycled LBS from WW Bales	382,396		127,161
Recycled LBS from Litho Plates	153,419		73,085
Recycled LBS from Magnets	110,458		35,419
Recycled LBS from Office Shred			
Recycled LBS from Metal Scrap	42,500		11,760
Recycled LBS from Scrap Pallets	78,683		35,982
Recycled LBS from Scrap PIV Batteries	13,668		
Recycle LBS of Dust Pucks/WTE	33,281		29,191
LBS sent through Trash Compactor	149,000	149,000	30,540
Tons sent trhough Trash	75	75	15
Total LBS Recycled	13,239,861	13,503,846	4,563,157
Total LBS Trash Landfill	149,000	149,000	30,540
Total LBS Shipped from Loveland	13,388,861	13,652,846	4,593,697
Total Recycle Income	$ 595,890.71		
Percent Recycled	98.89%	98.91%	99.34%
Percent Trash Landfill	1.11%	1.09%	0.66%
GOAL PERCENT	99.50%	99.50%	99.50%
Percent Away from Goal	0.61%	0.59%	0.16%
Total Pounds that Should have been recycled	13,321,917	13,584,582	4,570,729
Total Pounds that Should have been Waste	66,944	68,264	22,968
Total Pounds away from Goal	82,056	80,736	7,572
Need to reduce Land fill Percent	55.1%	54.2%	24.8%

Items Taken out of our Landfill

Plate Packing Material

Shrink/Stretch Cardboard Cores

Scrap Baling Wire

Tare Covers

Shrink/Stretch Wrapping

Cardboard

Items Taken out of our Landfill (cont)

White Strapping

Press Plastic / White Strapping

Broken Endboards

Plastic Ink Kits

Sheetstock Packing Material

Tin Ink Kits

Loveland's Drive for 99.5%

- First 5 Months of 2013 (Jan-May)
  - > 118,460 Pounds Sent to Landfill
    - 23,692 Avg Pounds Land Filled Per Month
  - > 8,531,512 Pounds Recycled
    - 98.63 % Recycle Rating
- June 1st to Nov 1st 2013
  - > 41,880 Pounds Sent to Landfill
    - 8,376 Avg Pounds Land Filled Per Month
  - > 9,564,197 Pounds Recycled
    - **99.56 % Recycle Rating**
- Improvements
  - > POU / Centralized Collections
  - > WTE Program Started
  - > 78% Reduction in Land Fill Waste

Contacts

- Chris Rynish — Shared Services - Recycling (corp)
- Jason Myre — Shared Services - Recycling (corp)
- Tom Estock — Corporate Environmental
- Ryan Roberts — Distribution Manager (Loveland)
- Gruff — Environmental Spokesgoat

- Earth911.com